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# The EU enabling legal framework for carbon capture and geological storage

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## Abstract

As part of the Barroso Package on Climate Change and Energy, adopted on 23 January 2008, the European Commission proposed an enabling legal framework for carbon capture and geological storage. This paper sets out and explains the approach. The legal framework comprises a Proposal for a Directive on the geological storage of carbon dioxide (COM(2008)18 final) and explicit recognition of capture, transport and storage of CO<sub>2</sub> in the proposal amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emissions allowance trading system of the Community (COM(2008)16 final). The first proposal covers the regulation of the elements of the CCS chain. Capture and transport are regulated using existing legal frameworks, but the proposal lays out a dedicated legal framework for storage. The framework builds on the IPCC 2006 Inventory Guidelines and the OSPAR 2007 risk management framework for CCS, and covers site exploration, selection, permitting, monitoring, reporting, measures in case of leakage, liabilities, financial provisions for any leakage, and access to the transport and storage network. The second proposal provides that capture, transport and storage of CO<sub>2</sub> are activities under Annex I of the Emissions Trading Directive, without any free allocation (as they are abatement activities). Emissions captured, transported and safely stored will be considered as not emitted under the ETS, but allowances will have to be surrendered for any leakage. Auctioning revenues from the third phase of the ETS (which proposes full auctioning for the power sector) will provide a potential source of finance for CCS demonstration.

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## 1. Introduction

In 2005 the European Commission Communication on meeting the Community's objective of limiting climate change to 2° C<sup>1</sup> clarified that in the context of the global reduction of CO<sub>2</sub> emissions of 50% by 2050, a reduction in emissions of 30% in the developed world by 2020 is required, rising to 60–80% by 2050, that this reduction is

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<sup>1</sup> COM(2007)02 final

technically feasible and the benefits far outweigh the costs, but that, to achieve it, all mitigation options must be harnessed. Carbon dioxide capture and storage is one such option, and the Second European Climate Change Programme (ECCP II) set up a Working Group on Carbon Capture and Geological Storage to identify the prerequisites for its deployment. The final report of the Working Group fed into the Communication on Sustainable Power Generation from Fossil Fuels of January 2007<sup>2</sup>, which set out an action plan for the Commission during 2007 including the development of an enabling legal framework for CCS. The Brussels European Council of March 2007 responded by urging the Member States and the Commission develop the necessary technical, economic and regulatory framework to bring environmentally safe CCS to deployment.<sup>3</sup> In response to this request, the Commission proposed as part of the Barroso Package on Climate Change and Energy, adopted on 23 January 2008, a proposal for a directive on the Geological Storage of Carbon Dioxide (Geological Storage Directive, or GSD) and explicit recognition of capture, transport and storage of CO<sub>2</sub> in the proposal amending the Emissions Trading Directive (ETD) 2003/87/EC.<sup>4,5</sup> This paper sets out and explains these proposals, together with recent regulatory developments, in particular in the European Parliament.

## 2. Scope of the Proposal for a Directive on the geological storage of CO<sub>2</sub>

Chapter 1 of the proposal for a Directive limits the scope to the geological storage of CO<sub>2</sub> because existing legal frameworks are suitable for regulating the capture and transport elements of the CCS chain. These existing frameworks are amended so as to apply to CO<sub>2</sub> capture and transport in Chapter 7 of the proposed Directive. The Environmental Impact Assessment Directive 85/337/EEC<sup>6</sup> is amended so as to require EIA of pipeline CO<sub>2</sub> transport above the same thresholds as for other pipeline transport; and to require EIA of any capture installation that is either attached to a project which itself requires an EIA, or where the total CO<sub>2</sub> stored is 1.5 megatonnes a year or more. The Integrated Pollution Prevention and Control Directive 96/61/EC<sup>7</sup> is amended to cover CO<sub>2</sub> capture from installations that fall under that Directive.

Two further comments on the scope of the GSD proposal are perhaps useful. The first concerns the treatment of Enhanced Hydrocarbon Recovery (EHR). The proposal does not refer to EHR, and the legal effect is that EHR which is not combined with storage of CO<sub>2</sub> falls outside the scope of the proposal, while EHR which is combined with storage falls within the scope, in virtue of its storage component. A pure EHR project would get no credit under the Emissions Trading System for any CO<sub>2</sub> trapped in the geological formation, since the proposed ETD revision recognizes only CO<sub>2</sub> stored in sites permitted under the proposed GSD. There is a further slight complication in that the definition of 'leakage' in the proposed GSD covers any release from the storage complex,

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<sup>2</sup> COM(2006)843 final

<sup>3</sup> Council Document 7224/07

<sup>4</sup> COM(2008) 18 final

<sup>5</sup> The Package also includes a proposed amendment to the Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (Emission Trading Directive) (OJ L 275, 25.10.2003, p. 32. Directive as amended by Directive 2004/101/EC of the European Parliament and of the Council (OJ L 338, 13.11.2004, p. 18)), a proposed Decision on the reduction of emissions in the sectors not covered by the emission trading system, a proposed Directive on the promotion of renewable energy, revised environmental State aid guidelines and a Communication on Early Demonstration of Zero Emissions Power Generation from Fossil Fuels. For additional information on the Package see: [http://ec.europa.eu/commission\\_barroso/president/focus/energy-package-2008/index\\_en.htm](http://ec.europa.eu/commission_barroso/president/focus/energy-package-2008/index_en.htm).

<sup>6</sup> OJ L 175, 5.7.1985, p. 40. Directive as last amended by Directive 2003/35/EC of the European Parliament and of the Council (OJ L 156, 25.6.2003, p. 17).

<sup>7</sup> OJ L 257, 10.10.1996, p. 26. Directive as last amended by Regulation (EC) No 166/2006 of the European Parliament and of the Council (OJ L 33, 4.2.2006, p. 1).

which in turn is likely to be amended to include surface installations such as injection and (for combined storage/EHR) extraction facilities. Leakage triggers corrective measures and reporting obligations, and the definition is not intended to apply to emissions from surface installations that are no more than necessary as a part of the normal process of EHR. Clarifications to that effect may well be made during negotiations.

The second comment on the scope is that storage in sites that extend beyond the territory of the EU Member States is not permitted. This is because without such a prohibition, any such site would count as a site permitted under the GSD, and thus CO<sub>2</sub> stored in the site would be recognized as not emitted under the proposal for a revised ETD, even though environmental controls could not be ensured for the portion of the site outside the Member States' territory. These controls are (i) those set out under the GSD itself, and (ii) the obligation to surrender allowances under the Emissions Trading System for any leakage from the storage site, which arises from inclusion of the storage site within the proposal for a revised ETD. There is no prohibition on export of CO<sub>2</sub> for storage in sites lying wholly outside the Member States' territory, since any emissions stored in such sites would not be recognized as not emitted under the revised ETD.

Storage of CO<sub>2</sub> in the water column is prohibited in line with the approach taken in international conventions (the London Protocol 1996 to the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, and the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)).<sup>8</sup>

### 3. Selection of the storage site, and site exploration

Chapter 2 of the Directive sets the framework for selection of the storage site. Article 4 stipulates first of all that it is for the Member State to determine which areas of its territory are to be made available for storage. This includes the right of Member States not to allow for any storage in all or part of its territory, and an explicit clarification to this effect is likely to be made in the course of negotiations. Article 4 then provides that a site can only be selected if under the proposed conditions of use there is no significant risk of leakage, and if no significant environmental or health impacts are likely to occur. Suitability for use is determined by characterization of the site according to the criteria specified in Annex I of the Directive, which take into account Part II Chapter 5 of the IPCC Inventory Guidelines 2006 and the Guidelines for Risk Assessment and Management of Storage of CO<sub>2</sub> Streams in Geological Formations. The aim is to ensure that only sites which are very unlikely to leak are selected for storage in the first place.

Obtaining the necessary data to perform the analysis in question will often require site exploration, and Article 5 requires that in such cases an exploration permit must be issued. However, the proposal does not impose

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<sup>8</sup> At the international level, legal barriers to the geological storage of CO<sub>2</sub> in sub-seabed geological formations have been removed through the adoption of related risk-management frameworks both under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972 London Convention) and under the Convention for the Protection of the Marine Environment of the North-East Atlantic (1992 OSPAR Convention). In 2006, the Contracting Parties to the 1996 London Protocol to the London Convention adopted amendments to the Protocol, which allow and regulate the storage of CO<sub>2</sub> streams from CO<sub>2</sub> capture processes in sub-seabed geological formations (for additional information see [http://www.imo.org/home.asp?topic\\_id=1488](http://www.imo.org/home.asp?topic_id=1488)). The Contracting Parties to the OSPAR Convention in 2007 adopted amendments to the Annexes of the Convention to allow the storage of CO<sub>2</sub> in sub-seabed geological formations, a Decision to ensure environmentally safe storage of CO<sub>2</sub> streams in geological formations and OSPAR Guidelines for Risk Assessment and Management of that activity. They also adopted a Decision to prohibit placement of CO<sub>2</sub> into the water-column of the sea and on the seabed, because of the potential negative effects (for further information see <http://www.ospar.org/eng/html/welcome.html>).

environmental constraints on the exploration activities. Rather, the purpose of the permit is to guarantee exclusivity to the explorer (in the form of a sole right to explore, and the prohibition of conflicting uses of the storage complex during the permit validity) so as to protect its financial investment. It has been pointed out in negotiations that such exclusivity is only appropriate for intrusive exploration such as drilling and injection tests, and the scope of the exploration permit is likely to be adjusted accordingly.

#### **4. Storage permits**

Chapter 3 of the proposal stipulates that no storage site may be operated without a storage permit, and sets out the requirements for the permit application, conditions for issuing the permit, contents of the permit, a Commission review of the draft permit decisions, and changes, update, review and withdrawal of storage permits. The contents of the application and the permit mirror substantive provisions included in the next chapter (Chapter 5) and will be discussed in that context. Two issues of particular significance in negotiation, however, are the Commission review of the draft permits, and provisions on the withdrawal of permits under Article 11.4.

The Commission review of the draft permits is matched by a review of the other key stage in the lifetime of a storage site, the decision on transfer of responsibility to the state under Article 18 of the Directive. In both cases, the draft decision is submitted to the Commission, which may within six months of submission issue a non-binding opinion. The final decision remains with the national competent authority, but the authority is required to state the reasons if the decision deviates from the Commission opinion. The Commission review power should be seen in the context of the concern expressed by certain Member States, Members of the European Parliament and stakeholders with regard to the enabling of a technology on which there is limited practical experience. In particular, it is not possible at present to set detailed harmonized requirements on a number of issues of relevance to the security and safety of storage sites, including site selection, monitoring, and composition of the CO<sub>2</sub> stream. In the absence of an alternative guarantee of consistent and safe implementation, there could have been significant pressure to postpone the enabling of CCS until further research had provided the basis for detailed controls. The Commission review, which is intended to apply in the early phase of implementation, and to lapse when no longer necessary to ensure consistent implementation, provides such an alternative guarantee. The European Parliament's Environment Committee, in its report on the proposal, supported the review, and there are also indications of substantial support from Member States. In terms of practicalities, the Commission intends to establish a Scientific Panel, comprising geological experts recruited by open competition on the basis of scientific excellence, to provide an assessment on which the Commission opinion will be based.

Article 11 provides for change, review, update and withdrawal of storage permits where certain conditions apply. Attention in negotiations has focused on the case of withdrawal, and its consequences as detailed in Article 11.4, which are that the competent authority assumes responsibility for the site. The Commission's intention was that withdrawal would only take place as a last resort, where other remedies had been exhausted; but that in such a situation, because of the imperative need to ensure the safety and security of the site, the competent authority should assume responsibility and either issue a new storage permit, or close the site down. The exact obligations taken over by the competent authority are not specified in the proposal, but are intended to comprise the obligations to monitor the site and take any necessary corrective measures under the proposal itself; the obligation to surrender allowances for any leakage under the Emissions Trading Directive 2003/87/EC; and the responsibility to take preventive and remedial action in relation to local environmental damage as required by the Environmental Liability Directive 2004/35/EC<sup>9</sup>. The taxpayer should not be responsible for any costs incurred by the competent authority in these circumstances, and the proposal requires that all costs be recovered from the operator to the extent possible. The financial security required under Article 19 is also relevant here, as discussed in Section 5 below.

#### **5. Operation, closure and post-closure obligations**

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<sup>9</sup> OJ L 275, 25.10.2003, p. 32. Directive as amended by Directive 2004/101/EC of the European Parliament and of the Council (OJ L 338, 13.11.2004, p. 18).

Chapter 4 of the Directive sets out obligations on the CO<sub>2</sub> stream, on monitoring, on reporting and inspections, corrective measures (forming part of the liability arrangements in case of leakage), closure and post-closure obligations, transfer of responsibility to the state and financial security. These are dealt with in turn below.

The approach taken to the composition of the CO<sub>2</sub> stream (Article 12) is based on that taken in OSPAR and in the London Protocol, and comprises qualitative criteria of which the main ones are a prohibition on adding any substances for the purposes of disposal, and a requirement that the concentrations of any contaminants from the source or capture process must not be such as to jeopardize the security of the transport infrastructure or storage site. The European Parliament's Environment Committee has proposed in its draft report on the proposed Directive<sup>10</sup> an amendment to the Directive to require a minimum CO<sub>2</sub> concentration of 95% plus the elimination of H<sub>2</sub>S and SO<sub>2</sub>. The Commission is considering this proposal, but the 95% concentration requirement would appear to present significant difficulties for certain applications of CCS, for instance for the cement and steel sectors and for power generation using lignite. Further, the complete elimination of H<sub>2</sub>S and SO<sub>2</sub> is not feasible. There are in any case safeguards to support the implementation of the Commission proposal: the Commission intends to produce guidance on the practical application of the qualitative conditions in the original proposal, and the capture installation will also fall under the IPPC Directive 96/61/EC, which will thus require that documents specifying Best Available Techniques (BAT Reference Documents, or BREFs) are developed for capture processes. Under proposals to revise the IPPC Directive, the emission limits established in the permit for a capture installation could not exceed those of the BREF unless an analysis showed that the environmental and economic costs and benefits justified a departure.

Article 13 sets out the monitoring obligations. A monitoring plan must be prepared based on Annex II of the proposal, so as to implement the purposes for monitoring which are set out in Article 13 paragraph 1. One particular issue here is the relation between monitoring under the proposed GSD, and monitoring under the Emissions Trading Directive. The latter requires monitoring and reporting guidelines (MRGs) to be developed for all categories of installation within its scope. The purpose of the monitoring is however different in each case. Monitoring under the GSD has a range of purposes, including verifying that the site is behaving as expected from the initial modeling, assessing any environmental damage from leakage, assessing the effectiveness of any corrective measures, and assessing whether the stored CO<sub>2</sub> will be completely and permanently contained. However, one of the central aims of the monitoring under the GSD proposal is to identify leakage (or situations likely to lead to leakage) so as to trigger corrective measures to rectify the situation. Monitoring under the Emissions Trading Directive, on the other hand, is required to quantify the amount of CO<sub>2</sub> emissions that must be covered by surrender of allowances. The split in activities between the two instruments is designed accordingly: monitoring to identify leakage will take place under the GSD proposal, and where a leakage is identified, monitoring under the MRGs of the Emissions Trading Directive will be triggered so as to quantify emissions. Draft MRGs<sup>11</sup> are currently under consultation with Member States and stakeholders, with the aim of adoption in 2009, thus giving operators and competent authorities a complete package of regulatory obligations at EU level.

Article 14 specifies reporting obligations on the operator, and Article 15 provides for annual inspections of the storage operation to be carried out by the competent authority. There has been some discussion in the institutions of whether the approach of independent verification taken under the Emissions Trading Directive's Article 15 is suitable for geological storage, but the Commission considers that inspection by the competent authority is the more secure option.

Article 16 requires that corrective measures are taken in the case of significant irregularities in the operation of the site, or any leakages. These measures would be taken on the basis of a corrective measures plan prepared by the operator and approved by the competent authority. In addition to these measures, two other obligations apply in the

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<sup>10</sup> Draft report European Parliament reference PE 407.716

<sup>11</sup> As amendments to Commission Decision 2007/589/EC of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC, OJ L 229, 31.8.2007, p. 1–85

case of leakage. The first is that an obligation to surrender allowances under the Emissions Trading Directive arises in virtue of inclusion of storage within the scope of that Directive in the proposed revision of the ETD. The second is that obligations for preventive and remedial measures pursuant to Articles 5 to 8 of the Environmental Liability Directive 2004/35/EC arise, in virtue of the inclusion of storage within the scope of that Directive by Article 33 of the GSD proposal. These measures taken together comprise the liability arrangements established for storage sites under the enabling legal framework. Other aspects of liability are not dealt with at EU level and are for Member States to regulate.

Article 17 sets out the closure and post-closure obligations for the site. The point of closure is defined as definite cessation of injection, and a period of post-closure stewardship then begins, during which the operator retains all responsibilities relating to the site. Those responsibilities must be discharged based on a post-closure plan, a provisional version of which forms part of the permit, and which is updated on closure. Where the competent authority decides to close a site for which the permit has been withdrawn pursuant to Article 11.4, the competent authority itself has the relevant responsibilities, but again must recover all costs from the operator.

Article 18 provides for transfer of responsibility of the site to the competent authority. The site is transferred if and when a certain condition is met, the condition being that all available evidence indicates that the stored CO<sub>2</sub> will be completely contained for the indefinite future. While the principle of having such a condition is broadly accepted, the particular formulation 'indefinite future' has been questioned, and an alternative such as 'completely and permanently contained' is thought to be a better formulation. The operator must document achievement of this condition in a report submitted to the competent authority, and on that basis the competent authority may produce a draft decision of transfer, which must then be submitted for Commission opinion (see section 4 above). At the point of transfer of responsibility, monitoring may cease but must be reactivated if any leakages or significant irregularities are identified, for instance by monitoring carried out under other Community legislation such as the Water Framework Directive 2000/60/EC<sup>12</sup>, the Marine Strategy Directive 2008/56/EC<sup>13</sup> or the Habitats Directive 92/43/EEC<sup>14</sup>). At this point also, the financial security is released, and the competent authority ceases to have the power to recover costs from the operator. This position is taken on the basis that if the condition for transfer is fulfilled, the prospective liabilities of the competent authority in relation to the site are likely to be very small. For sites closed by the competent authority following permit withdrawal under Article 11, a notional transfer point is defined triggering the same consequences.

In negotiations, three issues have raised in connection with this set of proposals. One is the cessation of monitoring, with a number of parties proposing that some reduced monitoring should continue after transfer to identify significant irregularities or leakages. The second is the question of whether a minimum period should be established before transfer can take place. The Commission is against any harmonized period at European level, on the grounds that the condition for transfer above is the important criterion, and individual sites are likely to vary substantially in the time taken to meet it. The third issue is the question of the treatment of any costs to the competent authority arising after transfer. One aspect of this concerns costs incurred in cases where there has been fault of the operator (including cases of deficient data, concealment of relevant information, negligence, wilful deceit or malpractice), where it seems sensible to allow cost recovery. The second concerns whether any further indemnification of the competent authority is required. If monitoring obligations are extended beyond transfer, it may also make sense to provide for a contribution from the operator to the competent authority to cover these costs. The European Parliament's Environment Committee has proposed to go further, however, by requiring a financial mechanism to be set up (based on payments from the operator starting at the commencement of injection) to cover also oversight and remediation costs incurred after transfer. As stated above, the Commission's view in bringing forward its proposal was that these costs are likely to be very low, and so no financial transfer was proposed.

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<sup>12</sup> OJ L 327, 22.12.2000, p. 1–73

<sup>13</sup> OJ L 164, 25.6.2008, p. 19–40

<sup>14</sup> OJ L 206, 22.7.1992, p. 7–50



The proposal did however cover, in Article 19, the establishment of a financial security by the operator to ensure that the permit obligations of the operator can be met, as well as the obligation to surrender allowances for any leakage under the Emissions Trading Directive. With regard to when the financial security should be in place, there have been representations to the effect that it need only be in place prior to commencement of injection, and not (for instance) at the time of submission of the permit application, and clarification of the text to this effect is likely in negotiations. Also, as the risks presented by a project vary over time, it makes sense to allow the security to vary over time accordingly. This is consistent with the proposal drafting, but explicit reference to such adjustment is also likely to be made in negotiation. As stated above, the financial security is intended to be released at the point of transfer to the state, because at that point all available evidence indicates that the stored CO<sub>2</sub> will be completely and permanently contained, and hence the remaining liabilities are taken to be very small.

## 6. Third-party access, general provisions and amendments

Access to CO<sub>2</sub> transport networks and storage operations could conceivably become a condition for competitive operation in the EU energy market, depending on the carbon price. Thus provisions on third-party access are required, but given the very early stage of development of CO<sub>2</sub> transport and storage, a light regulatory touch is appropriate. The proposals made in Chapter 5 of the GSD proposal are based on those in Directive 2003/55/EC<sup>15</sup> on the internal market in natural gas, and apply the principles of negotiated rather than regulated access, with the detailed modalities for access to be determined by the Member States taking into account certain principles established in the text. While this approach is appropriate for the early phase of CCS deployment, the Commission will keep the issue of access to CO<sub>2</sub> transport and storage infrastructure under close observation, and if there is any indication that anticompetitive practices are emerging, will come forward with further proposals as appropriate.

The general provisions of the proposal established in Chapter 6 are fairly standard, but two points deserve mention. The first is the arrangement for dealing with transboundary storage sites, complexes or transport infrastructure. Article 23 requires that in such cases the competent authorities of the Member States shall meet the requirements of this Directive and other relevant community legislation jointly. This effectively entails that in the case of a transboundary storage site or complex, any of the Member States on whose territory part of the site or complex lies has a veto over its use. At present, more detailed modalities at EU level are not appropriate, but the Commission will keep experiences under review and will make additional proposals as appropriate.

Several of the amendments of existing legislation to manage the case of CCS are dealt with earlier, but three others deserve specific mention. The first is the removal of carbon dioxide captured and stored for the purposes of geological storage, and stored in accordance with the proposed GSD, from the scope of the Waste Framework Directive 2006/12/EC<sup>16</sup>, and of shipments of CO<sub>2</sub> for geological storage from the scope of the Waste Shipment Regulation 1013/2006/EC<sup>17</sup>. In preparing the enabling legal framework on CCS the Commission considered carefully whether existing legislative frameworks in general, and the waste legislative framework in particular, were suitable for regulating CCS. However, it was apparent on analysis that while a number of elements of the waste legislation could in principle apply to various of the components of CCS, the nature of their application was not clear and the instruments themselves were not well-adapted to regulating the risks of CCS (having been designed for other purposes), and could only be made so by significant amendment. Thus to streamline the environmental controls on CCS it was decided to regulate the component elements separately from the waste legislation, and to take the components, so regulated, out of the waste legislative framework altogether.

The second issue concerns the Water Framework Directive 2000/60/EC, which currently prohibits injection into groundwater except in certain defined circumstances, with obvious implications for the storage of CO<sub>2</sub> in saline aquifers. This Directive is amended so as to allow CO<sub>2</sub> storage on the same terms on which natural gas storage in

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<sup>15</sup> OJ L 176, 15.7.2003, p. 57–78

<sup>16</sup> OJ L 114, 27.4.2006, p. 9–21

<sup>17</sup> OJ L 190, 12.7.2006, p. 1–98

saline aquifers is currently allowed, that is, in saline aquifers that are permanently unsuitable for other purposes (such as drinking water and agriculture) if certain conditions are met (including that the storage is permitted under the proposed GSD).

The third issue deserving mention is the amendment of the Large Combustion Plant Directive 2001/80/EC<sup>18</sup> so as to require that all new combustion plants over a certain threshold permitted after entry into force of the GSD must meet certain requirements relating to the possibility of CCS retrofit. The aim of this proposal is to avoid the lock-in of high-emitting technology by requiring new plant to make a full assessment of whether CCS can be applied in the future, and to reserve the space needed for retrofit. This is in the interest also of operators, since for a plant that will operate for 40 years in an increasingly carbon-constrained world to be unable to retrofit CCS could have a significant economic cost in the future. One element of unclarity in the initial proposal was whether the specified threshold, 300MW, referred to thermal input or electrical output. In fact the intention was to refer to electrical output, and if this is agreed, an appropriate clarification will be made during negotiations.

The Environment Committee of the European Parliament has proposed to go further, by requiring that all plant of 300MW and over permitted after 2015 shall meet a CO<sub>2</sub> performance standard of 500 gCO<sub>2</sub>/kWh. Given the available technological options, the practical effect of this is likely to be that no new coal-fired electricity generating capacity above the threshold could be permitted after 2015 unless it applied CCS. The Commission is examining this proposal, but one point to note is that it may not in practice stimulate any CCS deployment. The costs of CCS are likely still to be relatively high in 2015, and it may be that the performance standard will encourage a switch to gas rather than the construction of coal with CCS.

## **7. Treatment of CCS under the Emissions Trading System**

The carbon market established by the Emissions Trading Directive is in the Commission's view the main long-term incentive for CCS. Given that the environmental risks of storage are regulated, and provisions put in place to promote the security of the storage, the Commission has proposed that CO<sub>2</sub> that is captured, transported and stored in accordance with the proposed GSD be recognized as not emitted under the proposal for a revised Emissions Trading Directive, which governs the operation of the ETS from 2013 onwards. Thus combustion (or other) installations which capture CO<sub>2</sub> and pass it for transport and storage according to the proposed GSD will not have to surrender allowances for that CO<sub>2</sub>. This benefit on capture must be accompanied, however, by a corresponding disbenefit if the CO<sub>2</sub> leaks out again, and this is ensured by including capture, transport and storage explicitly under Annex I of the proposal for a revised ETD. The practical effect of this is that the installations in question must be monitored according to Monitoring and Reporting Guidelines adopted by the Commission (see the discussion of monitoring in Section 5 above) and allowances surrendered for any leaked emissions. At the moment, only pipeline transport is proposed to be included specifically within the scope of the ETD, as it is the central case of CO<sub>2</sub> transport. Requests to opt in transport by ship or other means can, however, be made by any Member State who wishes to use those methods, under Article 24 of the Emissions Trading Directive. Such requests are normally accompanied by suggested Monitoring and Reporting Guidelines and a decision is made by the Commission by comitology. Under the existing Directive, the Commission can opt in the installation in question or all installations of that type for the given Member State, but not all installations of that type for the whole EU. The revised Directive does however allow the last also to be done.

A further issue is the treatment of biomass emissions captured and stored under the ETS. Given that biomass emissions are regarded as non-emissions under the ETS, stored biomass emissions would have a claim to be regarded as negative emissions under the ETS. The Commission is aware of this possibility, and the proposal for a revised ETS provides that the Commission can adopt measures for issuing allowances in respect of projects that reduce greenhouse gas emissions outside of the Community scheme. Any Member State capturing and storing biomass emissions could request that such rules be adopted for that case.

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<sup>18</sup> OJ L 309, 27.11.2001, p. 1–21



Finally, there is the question of the role of the Emissions Trading System in stimulating demonstration of CCS. The first and principle role is via the recognition of emissions captured and stored as not emitted, as outlined above. However, the costs of projects to demonstrate the integrated application of capture, transport and storage at commercial scale are likely to high (for reasons such as first mover costs and scale issues) and are unlikely to be fully compensated by the carbon market. The Commission provided in its proposal for a revised ETD that at least 20% of auctioning revenues should be used for supporting climate-related activities, and in view of the particular case of demonstration projects has included CCS demonstration in the list of activities that can be supported. The Environment Committee of the European Parliament has proposed to go further in its draft report on the revision of the Emissions Trading Directive<sup>19</sup>, by reserving 500 million allowances from within the new entrants' reserve (NER) of the Emissions Trading System 2013-20 for support for CCS demonstration. The Commission is examining this proposal, but has stated that any funding mechanism for CCS demonstration must meet certain basic criteria: it must not inflate the ETS cap, it must be limited in time, it must be targeted on demonstration projects only, it must allocate support efficiently, it must minimize distortion of the ETS, and it must provide only leverage financing. The European Council of June 2008 has taken a similar approach, particularly on leverage financing, calling on the Commission to bring forward a mechanism to 'incentivise Member State and private sector investment' rather than to replace it.<sup>20</sup>

## 8. Conclusions

The proposals put forward in January 2008 on CCS in the EU cover environmental controls, treatment of liabilities, and incentives. The emphasis is on enabling CCS: it is for Member States to determine whether to allow CCS on their territory, and it is for operators to decide whether to deploy CCS based on conditions in the carbon market, although measures are taken to avoid lock-in of high-emitting technology. The Emissions Trading System is the principle mechanism for incentivizing CCS deployment in Europe, but the early phase of demonstration will require additional support, and the Commission proposes that auctioning revenues can be used by Member States to support demonstration. The basic outline of the Commission proposals has been welcomed by the European Parliament and the Council. Negotiations are ongoing, and adoption is hoped for by early 2009, in line with the rest of the climate and energy package. The Commission proposes that CCS Monitoring and Reporting Guidelines under the Emissions Trading Directive also be adopted shortly after, to provide a complete set of regulatory requirements at European level so as to allow deployment to proceed.

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<sup>19</sup> Draft report European Parliament reference PE 407.778

<sup>20</sup> Council document 11018/08